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SHIP FINANCE FOR DEVELOPING COUNTRIES

Report by the UNCTAD secretariat

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INTRODUCTION

(i) The Committee on Shipping by its resolution 65 (XIV), paragraph 4, requested the UNCTAD secretariat to prepare a study on ship financing for developing countries. The relevant paragraph of the resolution reads as follow:

> "4. Requests the UNCTAD secretariat to study the prevailing ship financing arrangements and assess their adequacy in meeting the requirements of developing countries and report the results to the Committee on Shipping at its fifteenth session;"

(ii) The present report reviews the situation for the period 1985-1991 and provides an update of the observations and conclusions of the earlier reports prepared by the secretariat. [1] The issues covered by the secretariat's prior reports on ship financing generally remain valid. Repetition of those issues is avoided in the present report except for reasons of clarity or up-dating.

(iii) In recent years the capital cost of ships has increased substantially. At the same time the capital available for financing investment needs has also declined. The erosion of capital base of shipping enterprises during the depressed markets has given rise to additional ship financing problems. Equally, certain ship financing institutions have innovated some new concepts in capital financing. The present report attempts to demonstrate, by detailed comparison and direct evidence, the effect of varying terms and conditions of ship financing on the feasibility of acquisition of ships and on the financial viability of a ship throughout its operating life.

(iv) The report consists of four chapters. Chapter I covers general observations on the present shipping markets and the fleet development of developing countries and makes a quantitative assessment of tonnage replacement and addition up to year 1995. Chapter II focuses on the types and sources of finance for acquisition of ships. Chapter III makes an assessment of ability to repay loans under selected financing terms at current freight rates. Finally, chapter IV presents conclusions and recommendations.

(v) The information used for this report was obtained from the following sources:

(a) responses to the note sent by the UNCTAD secretariat to the States members of UNCTAD (dated 28 February 1992);

(b) responses to a communication sent by the UNCTAD secretariat to selected commercial banks and ship mortgage banks;

(c) responses to a communication sent by the UNCTAD secretariat to international and regional development banks and other development finance institutions;

(d) responses to a communication sent by UNCTAD secretariat to selected shipping companies of developing countries;

(e) additional information obtained from published sources.

The responses have been integrated in the appropriate sections of this study. While a larger number of responses would have provided a better basis for analysis, the available information does provide a useful indication of the main features of ship financing in developing countries.

(vi) The UNCTAD secretariat wishes to acknowledge with gratitude the cooperation of Governments and the various organizations which supplied information in response to the note or the communications.

Chapter I

DEMAND FOR NEWBUILDING IN DEVELOPING COUNTRIES

General observations

1. After a prolonged depression the present shipping industry's outlook is one of optimism. The 1980s were dominated with low freight rates and eroding ship values. Indicators which point to improved conditions in the years ahead are affirmed by the increase in values of second-hand ships and buoyant markets in certain sectors of the shipping industry. Perhaps the most important indicator is the diminishing gap between supply and demand as the market approaches equilibrium. The tonnage balance had improved from a oversupply of 27.6 per cent of the active merchant fleet in 1981 to 10.7 per cent in 1990. Tables 1 and 2 give detailed information on the oversupply situation. A disturbing feature for all the participants in the maritime transport industry is that in certain sectors the fleet is ageing and hence the urgency for replacement of tonnage.

Table 1

Tonnage oversupply in the world merchant fleet, 1981-1990
(Million dwt and percentages)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
	(Million dwt)									
World merchant fleet (as at mid-year)	688.8	693.5	686.0	674.5	664.8	639.1	632.3	627.9	638.0	658.4
Surplus tonnage a/	149.1	184.1	195.8	171.2	161.5	108.0	101.1	83.4	62.3	63.7
Active fleet b/	539.7	509.4	490.2	503.3	503.3	531.0	531.2	544.5	575.7	594.7
	(Percentages)									
Surplus tonnage as a percentage of the world merchant fleet	21.6	26.5	28.5	25.4	23.4	16.9	16.0	13.3	9.8	9.7
Surplus tonnage as a percentage of the active world merchant fleet	27.6	36.1	39.9	34.0	32.2	20.3	19.0	15.3	10.8	10.7

Source: UNCTAD, *Review of Maritime Transport, 1990*, TD/B/C.4/340.

2. Analysing the decision-making process specifically in relation to ship investment, two factors emerge as triggers. It has been observed that new investments in ships are often triggered by rising freight rates and positive expectations of their future development. Historically, there had been a close relationship between freight rates and price of newbuilding and second-hand ships. Graphs 1 and 2 display the past trends. Details of prices for different types of ship are listed in annex I.

Table 2

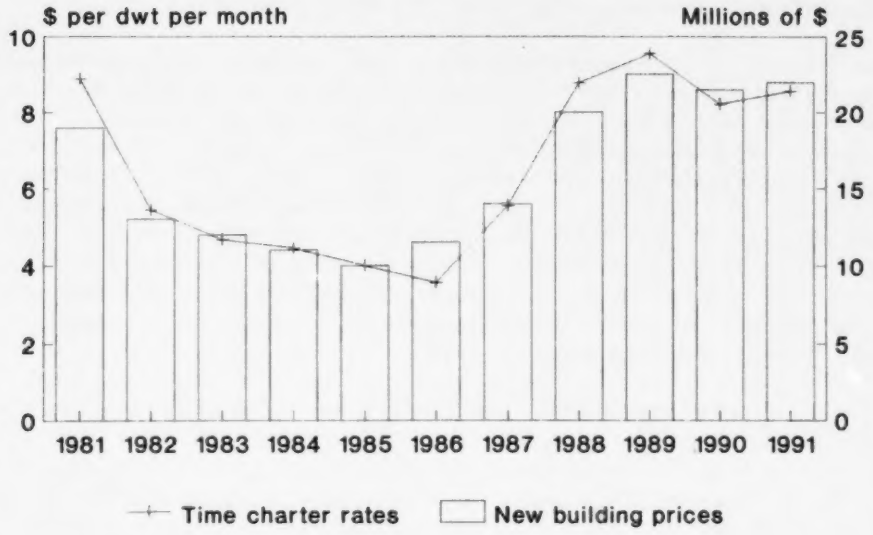
Analysis of tonnage oversupply by vessel type, 1981-1990
(Average year figures in million dwt)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Supply of world tanker fleet	341.3	335.0	319.4	296.7	273.0	261.7	255.1	250.6	253.9	266.2
Total tanker surplus fleet	107.7	130.7	134.0	111.7	100.9	68.8	65.8	54.7	41.0	41.0
Share of surplus fleet in the world tanker fleet (per cent)	31.5	39.0	41.9	37.6	36.9	26.3	25.8	21.8	16.1	15.4
Supply of world dry bulk fleet	184.0	197.0	202.9	215.0	222.7	215.4	213.8	220.6	225.4	228.7
Dry bulk fleet surplus	36.4	46.4	52.0	50.3	50.1	30.8	28.0	23.4	17.0	19.3
Share of surplus in the world dry bulk fleet (per cent)	19.8	23.5	25.6	23.4	22.5	14.3	13.1	10.6	7.5	8.4
Supply of world general cargo fleet	108.4	85.4	82.1	79.8	74.9	69.7	65.6	64.7	63.4	63.1
General cargo fleet surplus	4.4	6.1	8.3	7.6	5.8	4.3	3.6	2.9	2.2	1.8
Share of surplus in the world general cargo fleet (per cent)	4.0	7.1	10.1	9.5	7.7	6.2	5.5	4.5	3.5	2.8
Supply of world unitized fleet	21.1	22.9	25.2	27.3	29.9	31.2	32.9	34.4	35.8	37.5
Surplus of unitized fleet	0.6	0.9	1.5	1.6	1.7	1.5	1.7	0.8	0.8	0.5
Share of surplus in the world unitized fleet (per cent)	2.8	3.9	5.9	5.9	5.7	4.8	5.2	2.3	2.2	1.3

Source: UNCTAD, *Review of Maritime Transport, 1990*, TD/B/C.4/340.

Graph 1

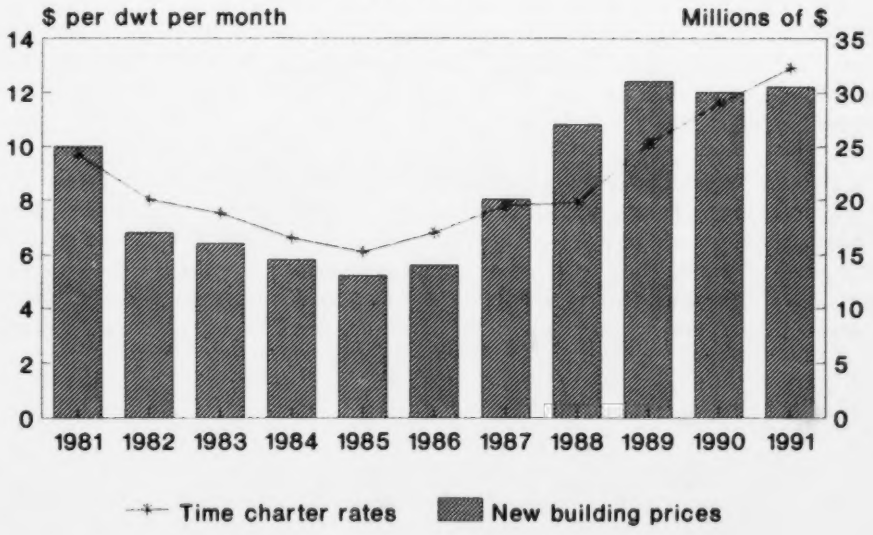
Relation between time charter rates and new building prices
for a 27,000 dwt bulk carrier
1981 - 1991



Source: Fearnleys (Oslo) *Review 1991* (for newbuilding prices); *Lloyd's Shipping Economist* (London), various issues (for time charter rates).

Graph 2

Relation between time charter rates and new building price
for a 30,000 dwt tanker
1981 - 1991



Source: Fearnleys (Oslo), *Review 1991* (for newbuilding prices); *Lloyd's Shipping Economist* (London), various issues (for time charter rates).

3. A prudent strategy for purchase of ships would be to buy ships when the prices are low. However, at such a time the freight rates would most probably also be low, thus reducing the confidence of the investors in the venture. Thus shipping enterprises find it difficult to raise capital. On the other hand, if capital were easily raised in a high freight period to purchase expensive ships, such ships, because of their high capital costs, may not be economically viable in the long run or if there is a downturn in the freight rates. Ideally, it would be best to raise capital in high market situation and exploit opportunities of low market to purchase ships.

4. For a capital-intensive business like shipping, terms and conditions of financing arrangements are of key importance, as they would dictate the success or failure of the enterprise. The majority of developing countries rely entirely on the import of ships. The use of scarce foreign exchange to service capital loans is an added difficulty under the present balance of payments situation of most developing countries. Keeping in view the structural adjustments which are taking place in the economies of developing countries and the process of liberalization of the shipping sector, through either increased participation of the private sector or privatization/commercialization of State-owned shipping enterprises, the need for injection of equity capital is evident. To raise equity capital in the capital markets, even the private sector shipping enterprises are at times constrained by the issue of the solvency of the State in which the enterprise is registered. At times ships could not fly the flag of the state and had to be registered under open registry flag in order to have access to funds for acquisition. Furthermore, unless a satisfactory level of profit is forthcoming it is very difficult to attract capital.

5. The average age for all ships was 14.06 years as of end-June 1990 in contrast to 12.98 years a year earlier. While there had been awareness of the ageing fleet, concerns were equally voiced on the possibility of shortage of capital for investments. An analysis carried out by a shipping economist of a leading commercial bank estimated that about 355 million dwt of newbuilding would be required between 1989 and 2000. [2] Of the 355 million dwt, replacement demand was put at 312 million dwt and the remaining of 43 million dwt was attributed to expansion demand. For this tonnage the financing requirement was estimated to be $US 215.7 billion. This works out to an average requirement of 30 million dwt of newbuilding per annum. With the reduction of shipbuilding capacities globally, the new building deliveries in 1990 was 22.8 million dwt and provisional figures for 1991 was 23.4 million dwt. For a developing country, a World Bank report estimates a investment requirement of $US 7.95 billion to the year 2000. [3]

6. Fleets of developing countries over a five years period had increased from 113.4 million dwt in 1985 to 139.7 million dwt in 1990. When compared to the world fleet, their share increased from 17.1 per cent in 1985 to 21.2 per cent in 1990. Table 3 shows the distribution of tonnage owned by developing countries by regions in terms of dwt.

7. Analysing developing countries fleet by ship type, as of end June 1990, the distribution were bulk carriers 43 per cent, followed by oil tankers 28.7 per cent and general cargo accounting for 19.2 per cent. The containership fleet constituted 2.9 per cent and other categories of ships 6.1 per cent. A detailed breakdown of the developing countries fleet between 1985 and 1990 is shown in table 4.

8. The age profile of the developing countries fleet was slightly less than average for the world fleet, in all categories of ship types except in case of general cargo ships. It can be observed from table 5 that the developing country fleet had been ageing over the past few years. The options available for reducing the age profile of the fleet are, to purchase relatively younger ships through the second-hand market, to order new ships, or to scrap the older tonnage. Large scale fleet renewal through acquisition of second-hand tonnage may not be feasible, as 69 per cent of the fleet owned by other countries than those of the developing countries are of 10 years and over.

Table 3

Tonnage owned by developing countries by region
(in millions of dwt)

	1985	1986	1987	1988	1989	1990
World Total	664.8	639.1	632.3	627.9	638.0	658.4
Developing countries	113.4	127.0	132.3	131.2	135.0	139.7
of which in:						
- Africa	8.0	7.5	7.3	7.7	7.3	7.3
- America	23.3	25.9	24.7	24.6	25.4	25.5
- Asia	78.6	85.1	91.3	87.2	89.0	89.5
- Europe	3.0	7.9	7.8	10.0	11.5	13.8
- Oceania	0.4	0.5	1.2	1.7	1.8	3.6

Source: UNCTAD, *Review of Maritime Transport*, various issues.

Table 4

Developing countries fleet by principal ship types
in '000 of dwt

Ship type	Year					
	1985	1986	1987	1988	1989	1990
Tankers	33 683	36 354	38 748	37 158	38 524	40 136
Bulk carriers	45 073	54 252	56 477	56 476	57 227	59 990
General cargo	25 350	25 974	25 855	26 016	26 214	26 853
Containerships	2 416	2 799	2 777	3 150	3 765	4 145
Other types	6 830	7 595	8 506	8 368	9 196	8 564

Source: UNCTAD, *Review of Maritime Transport*, various issues.

Table 5

Average age of developing countries fleet by ship type

Ship type	Year					
	1985	1986	1987	1988	1989	1990
All ships	11.35	11.42	11.72	11.99	12.67	13.44
Tankers	10.63	11.75	12.24	12.85	14.05	15.13
Bulk carriers	10.18	10.15	10.25	10.14	10.72	11.13
General cargo	13.78	13.95	14.40	14.87	15.19	15.79

Source: UNCTAD, *Review of Maritime Transport*, various issues.

9. To have an estimate of the magnitude of finance required for newbuilding, the starting point would be the replacement of the old ships. Further, there would be a need for some additional tonnage to cater to the growth in trade and fleet expansion activities. These total volumes of tonnage, if multiplied by the current average price per tonne of construction cost, would give an estimate of the gross investment required. An attempt is made here to only provide indicative figures, while due consideration should be given to the developments in the shipbuilding industry in the future and policy directions taken by the developing countries with regard to their participation in shipping.

10. Table 6 provides details as of end-June 1990 of the developing countries fleet by principal ship types and age grouping in terms of dwt.

Table 6

Age profile of developing countries fleet by ship type
in terms of '000 of dwt as of end June 1990

Ship type	Total	Age in years			
		0 - 4	5 - 9	10 - 15	15 +
All ships	116 850	14 541	26 912	30 693	44 704
Tankers	34 796	3 304	5 112	9 607	16 774
Bulk carriers	46 759	8 673	15 685	9 931	12 470
General cargo	23 924	1 034	3 265	7 910	11 716
Containership	3 497	982	747	1 005	764
Other types	7 872	545	2 103	2 240	2 980

Source: UNCTAD, based on information supplied by Lloyd's Maritime Information Services Ltd.

11. As a base case, if the following assumptions were made:

- that progressively up to 1995, all ships currently over the age of 15 years would be replaced as they approach the end of their economic life. This would translate to 44.7 million dwt to be replaced;

- the additional tonnage requirement were based on the past growth rate, on average the growth of the developing countries fleet has been at 5.26 million dwt per year between 1985 and 1990. The average for the period 1970 to 1990 had been at a rate of 4 million dwt per annum;

- of the average growth of 5.26 million dwt per annum, about 70 per cent of the tonnage addition was acquired through newbuilding between 1985 and 1990, and similar proportion would account for newbuilding in the future;

- the fleet composition by ship type did not change significantly in the past and the future fleet composition would remain the same.

12. On the above assumptions, the growth to be expected between 1990-1995 would result in a tonnage addition of 26.3 million dwt for the period. Applying the ratio of 70 per cent for newbuilding to expected tonnage addition between 1990-1995 translates to a requirement of about 18.4 million dwt of newbuilding.

13. Hence, the total tonnage, replacement and addition tonnages until 1995, would be about 63 million dwt, at a total cost of $US 58.3 billions. This translates to an average of 12.6 million dwt or $US 11.66 billions per annum investment initiative to be undertaken by the developing countries.

14. Table 7 estimates the magnitude of finance required based on above assumption of fleet composition by ship types, based on average costs of construction per dwt by ship type at 1991 prices. While these cost are only indicative there are possibilities that the total requirement would follow an upward scale, as studies suggest that the ship prices are likely to go up for a variety of reasons which are beyond the scope of the present study to examine.

Table 7

Investment in ship acquisition by developing countries, 1990-1995

Ship type	Newbuilding required in millions of dwt	Price per dwt (1991 price) in $US	Investment required in billions of $US
Tankers	24.7	620	15.3
Bulk carriers	17.7	575	10.2
General cargo	15.2	1600	24.3
Containerships	1.3	1850	2.4
Others	4.1	1500	6.1
Total	63.0		58.3

15. Fleet replacement could be postponed by developing countries, on the assumption that certain initiatives were undertaken to extend the economic life of the ship. However, as countries other than developing would also be undertaking fleet renewal, a problem which may be faced at later period of time by developing countries, would be the shortage of shipbuilding capacities. Such a shortage could become a major constraint to new investments in the newbuilding sector. Reports suggest that the far eastern shipyards had full order books, and at current production capacity and level, have work until the end of 1994.

16. If no fleet expansion for developing countries were considered, just to maintain the current tonnage levels, replacement tonnage requirement theoretically amounts to 44.7 million dwt. At above price estimates, this would represent a financing requirement of about $US 42.2 billion for the period 1990-1995.

Chapter II

TYPES AND SOURCES OF SHIP FINANCING

A. Terms and conditions of ship loan agreements

17. Loan agreements consist of several variables, which when summed up determine the degree of hardness or softness of the credit terms. These variables include the following:

(1) Down payment, which is generally a percentage of the price of the ship for which the credit is available;

(2) The rate of interest, the commitment fee and service charges;

(3) The loan repayment period;

(4) The grace period.

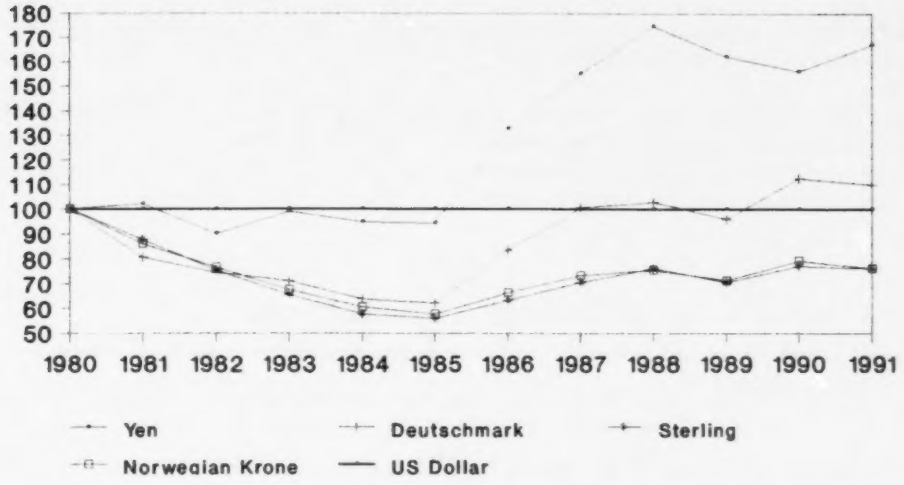
18. A decrease in the percentages for down payment and interest rates and increase in repayment and grace periods would result in softer terms. The effect of these on the projected cash flows is substantial and is demonstrated in the examples in chapter III of this report. Other important elements of loan agreements are the currency of repayment, and the guarantee which the borrower is asked to provide. Fluctuation in these elements, either individually or in combination could either, favourable or unfavourable, affect the outcome of the investment. As external factors influence the movement of these elements, there is very little or no control exercised by a shipping enterprise.

19. Graph 3 indicates the movement of major shipping currencies relative to the dollar. The relevance of these movements may have an effect on the repayment of loans, if they had been availed in currencies other than dollars, since freight earning are generally quoted in dollars. If a ship was purchased using Japanese Yen, this would result in serious repayment difficulties on account of appreciation of the yen against the dollar. As Japan has not offered dollar denominated contracts for the past few years, the potential risk involved in Yen denominated contracts with delivery dates two years away could be formidable. If a newbuilding were to be contracted in 1990, when the yen/dollar rate was Y 143.6/$US, fully aware that the yen strengthening would occur between signing of contract and delivery, would face a 6 per cent appreciation of the ship price in dollar terms in a matter of a year. The yen/dollar rate average during 1991 was Y 134.6/$US. Similarly, the Deutschemark, though depreciated against the dollar till 1985, but recovered its position in two years and is currently above the 1980 parity. Future movements are not easily predictable. Sophisticated currency hedging instruments have been developed in the financial markets and the shipping industry has made use of such options. In currency swapping arrangements additional cost and risks are borne by the shipowner. However, from a loan point of view, in an appreciating dollar situation, it would be advisable to shift to other currencies and while the dollar is declining to retain the loan in dollar denomination.

20. Graph 4 shows the movement of London Inter Bank Offered Rate (LIBOR) for six month deposit in dollars. Loans availed in floating interest rates would be charged a few points above the LIBOR and is dependent on the volume of transaction and the credit rating of the borrower. For shipping loans, this spread varies between 1.5 per cent and 2.5 per cent. In certain transactions it had been at a lower percentage. The use of a fixed or a floating interest rates would depend on the choice of source of finance.

Graph 3

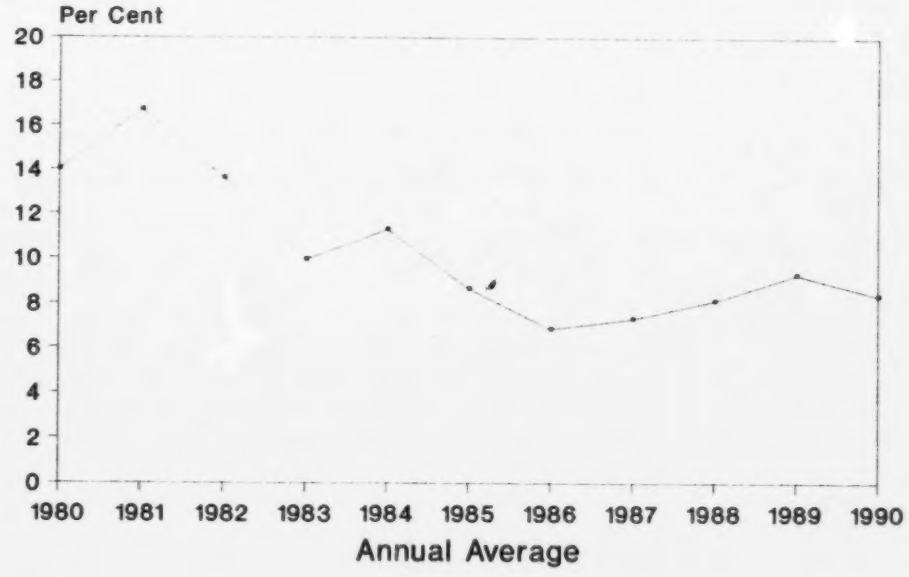
Movement of principal shipping currencies
against the dollar (index 1980 = 100)



Source: *International Financial Statistics Yearbook*, IMF, 1991.

Graph 4

Movements in London Inter Bank Offered Rates
Based on six months $US deposit



Source: *International Financial Statistics Yearbook*, IMF, 1991.

21. The LIBOR rates had not had volatile fluctuations over the past five years in contrast to the period between 1980 and 1985. Between 1988 and 1990 the average rate was 8.35 per cent. It had been possible to swap between the fixed and floating interest rates to take advantage of the finance market situations but would be at additional cost to the shipowner. From a cash flow situation, fixed interest rates offer additional security towards forecasting repayment of loans, thus reducing interest exposure risks.

22. Table 8 gives a comparison of the different interest rates. It must be noted that only OECD credit is offered at a fixed interest rate and others are floating rates.

23. Securities which are to be furnished may be preferred mortgage, assignment of income to bank, assignment of insurance, bank guarantees, personal guarantees, pledges of other assets and other collateral. Bank guarantees to be furnished by the borrower, normally cost would be about 1 to 2 per cent of the value of the transaction and are based on the credit rating of the shipping enterprise.

Table 8

Interest rates comparison

Year	OECD	LIBOR	National interest rates of selected shipbuilding countries						
			United States	Germany	France	Norway	Sweden	United Kingdom	Japan
1980	8.0	14.03	13.36	9.06	11.85	11.16	12.17	15.62	10.93
1981	8.0	16.72	16.38	11.26	15.30	12.35	14.35	13.12	7.43
1982	8.0	13.60	12.26	8.67	14.87	13.91	13.29	11.36	6.94
1983	8.0	9.93	9.09	5.36	12.53	12.27	10.85	9.09	6.39
1984	8.0	11.29	10.23	5.55	11.74	12.67	11.77	7.62	6.10
1985	8.0	8.64	8.10	5.19	9.93	12.29	13.85	10.78	6.46
1986	8.0	6.85	6.81	4.57	7.74	14.15	10.15	10.68	4.79
1987	8.0	7.30	6.66	3.27	7.98	14.66	9.16	9.66	3.51
1988	8.0	8.13	7.61	4.01	7.52	13.29	10.08	10.31	3.62
1989	8.0	9.27	9.22	6.59	9.07	11.31	11.52	13.88	4.87
1990	8.0	8.35	8.10	7.92	9.85	11.45	13.45	14.68	7.24

Source: IMF, *International Financial Statistics Yearbook*, 1991.

B. Sources of ship financing

24. The potential sources of financing for the purchase of ships have not radically changed over the past five to seven years. They are equity investments, bank or export credits, loans from international institutions, bilateral aid loans from governments, and specialized ship mortgage banks. The debt liability of the shipping industry, had grown in contrast to other industries, partly due to the huge amounts required.

1. Equity investments

25. Equity investment could be from both internal and external resources. Internal resources would be in the form of retained profits from prior earnings or accumulated depreciation or other reserves. In the past, these forms of resources had played a dominant role in the capital structure in existing shipping enterprises. Under the depressed freight market conditions, most shipping enterprises were incurring losses. Consequently an increasingly large portion of the future financing requirements would have to be met from external sources.

26. External resources are in the form of issuing of shares on the capital market. Capital markets are highly regulated and in order for an enterprise to raise capital it must achieve the recognised standard of "credit-worthiness" and offer a competitive rate of return to investors. Given the poor track record of performance by many shipping enterprises, on account of volatile fluctuations in the freight rates, it had been difficult to generate sufficient confidence among the investors to subscribe to capital issues made by them. Capital markets in the majority of the developing countries were dominated by the manufacturing sector and service sectors like shipping had a marginal role. Moreover, the dominance of public sector in shipping enterprises of developing countries further reduced the potential use of the capital market as a source of funding. However, these enterprises must be expected to provide equity capital, from private or government sources, in some proportion towards the capital requirements.

2. Commercial banks

27. About 40 commercial or specialized ship mortgage banks were requested to provide information on any financing arrangements they had made to shipping enterprise in developing countries, including arrangement for loans, the terms used for the financing arrangements and conditions for eligibility.

28. Replies were received from 17 banks, of which 10 stated that they had not provided any ship financing to developing countries over the past five years. One bank declined to give information. One bank stated that it was involved in financing through a international financing institution for the purchase of a ferry. Another bank advised on two project proposals for developing countries but it did not participate in financing. Only four banks of the sample, one of which is from a developing country stated that they were involved in financing ships.

29. Banks A and B stated that they were actively involved, and had concluded arrangements which would not have been possible with other international banks, owing to above average country risk. However, they did not provide information on the size of loans arranged. Bank C had primarily concentrated on financing second-hand ships to the private sector rather than public shipping lines. Generally, it provides finance for 50-60 per cent of the asset value. The period of financing was short, typically two-three years and, in specific cases, for a maximum five years. However, the ship must be registered under a flag suitable to the bank. The average loan size was around $US 10 million.

30. Bank D provided a maximum of 70 per cent of the purchase price provided the overall debt equity ratio of the enterprise as a whole is restricted to 2:1. The interest charge, if fixed, varied between 11-12 per cent, and if floating rates were used the spread was between 2.5-3.5 per cent above LIBOR. The repayment period was limited to a maximum of 75 per cent of the economic life of the ship. Typically this related to a period of 5 to 10 years, depending on the ship being purchased. They also provided for leasing charged at market rates - currently 10.5 per cent. The payments were structured to take into account the capital cost and a minimum return. At the end of the lease period the lessee could acquire the ship at a residual value, normally the acquisition cost being in the region of 2-5 per cent of the price of the ship.

31. As early as 1984, the international commercial banking system had gone through a crisis of confidence, which, though not specifically related to shipping, had an efect on lending attitudes. Although banks lending to the shipping industry represented a small part of the total, the increase in number of problems with the loans, resulted in banks taking much tougher actions over the defaulted loans. [4] The need for banks to write off bad debts in shipping, must be considered as a part of the wider banking crisis. Banks faced with capital adequacy problems of their own and increased regulation related to lending had to adopt a rigorous attitude towards ship financing.[5] This led to a period where the borrowers were divided into two distinct categories, first class and others. Those in the "others" category generally found it difficult to raise finance on attractive terms.

32. The bankruptcies of established shipping enterprises had taught some hard lessons to the financial institutions. According to the Vice-President of a major shipping bank, two lessons were learnt. [6] First, the terms and conditions offered in the past had been too generous. Second, banks had been too loose in evaluation of the risks in shipping. During 1983, banks were willing to put up 80 per cent to 90 per cent of shipping ventures, with a repayment period of ten years. The banking industry standard has been revised over the years, and currently they offer 60 per cent to 70 per cent over a shorter duration of seven to eight years. The use of long-term charters as a collateral has not been accepted on account of increases in the premature termination of charter agreements.

33. The lack of an adequate international convention on maritime liens and mortgages had been a major problem for the financiers in protection of their investments. Most of the legislation in developing countries governing maritime liens and mortgages is confined to national jurisdiction. From a financier's point of view the inability to exercise control over the mortgaged assets beyond a national boundary, in case of default on the loan, had often been the cause for not supporting investment initiatives. Hence the insistence by financiers on registering the ship under the flag most suited to them. To alleviate these problems, a Joint UNCTAD/IMO Intergovernmental Group of Experts was entrusted with the task of elaborating a draft convention on maritime liens and mortgages. The objectives of the draft convention are: (a) to provide a generally acceptable legal framework governing the recognition and enforcement of maritime liens and mortgages and thus achieve international uniformity; (b) to strengthen the international position of the mortgagees and financiers of shipbuilding and ship purchase and thereby to improve the conditions for ship financing at the international level. A Conference of Plenipotentiaries will be held in the spring of 1993 to consider and adopt the draft convention on maritime liens and mortgages.

34. Generally, the commercial banks have played a significant role in the provision of finance for purchase of second-hand ships. Equally, much of the newbuilding financed through government-backed export credit schemes, specifically the shipbuilding credit, has been with cooperation of the commercial banking system.

3. Export credits

35. The use of export credit financing had been the main method for financing of newbuildings. Under the export credit system, an international agreement which governs the terms and conditions for shipbuilding is the OECD Understanding on Export Credits for Ships. The current Understanding is 80 per cent of the contract value at an interest rate of 8 per cent with repayment over eight and half years from delivery in equal semi-annual instalments. Participants in the OECD Understanding are the countries of the European Economic Community, Finland, Japan, New Zealand, Norway and Sweden. The Republic of Korea, while not a member of OECD, provides shipbuilding credits on the lines of OECD agreement.

4. International and regional development banks and financial institutions

36. Information was requested from eight institutions [7] and replies were received from three institutions.

37. The Asian Development Bank (ADB) stated that it is not usually involved in direct ship financing but had indirectly financed ship purchase activities under the scope of a more broad based maritime transport development project or through sub-loans made available to Development Finance Companies (DFC). These sub-loans were made use of by enterprises both in the private and public sectors. The funds were used to acquire new and predominantly second-hand ships which totalled SUS 100 million. However, only a minor portion of this total amount has been lent since 1985.

38. The ADB considers that, apart from depression in shipping markets, the introduction of new guidelines by the bank for procurement of second-hand ships has contributed to the decline in lending through sub-loans. The guideline requirements include strict age limits, independent technical and valuation survey reports, classification of the ship with a member of the International Association of Classification Societies and compliance with major international conventions on safety, tonnage and loadline, etc. In addition, above a varying free limit amount, the borrower is expected to provide a detailed appraisal on managerial capacity, financial capacity, his experience in the industry and anticipated financial rate of return for the proposed project.

39. The Islamic Development Bank (IDB) indicated that since its inception in 1975 it had been involved in financing of ships for enterprises in its member countries, totalling about SUS 155.8 millions. Table 9 gives a list of loans sanctioned by the IDB since 1975 to date.

40. Two modes of financing were used to finance ships for its clients, either through the lease arrangement or through instalment sale. The distinction between the two is that in the former case the title of the ship vested with IDB till the last lease instalment is paid, subsequently the ship is transferred to the lessee as a gift. In case of instalment sale the ownership of the ship is transferred to the enterprise on delivery of the ship. IDB had financed the full cost of acquisition.

Table 9

Islamic Development Bank shipping loan approvals
1975 - 1992

Effective year	Country	Financing mode	A nount $US millions	Remarks
1979	A	Lease	6.0	
1980	B	Lease	11.0	
1981	C	Lease	3.5	
1982	D	Lease	16.0	
1982	C	Lease	3.4	
1983	A	Lease	10.4	
1984	E	Lease	8.0	
1986	C	Instalment	7.0	
1987	A	Lease	5.5	
1987	A	Lease	5.5	
1988	B	Instalment	20.0	implementation
1989	F	Instalment	15.0	
1989	G	Instalment	10.0	
	G	Instalment	9.0	approved
	H	Instalment	13.0	approved
	I	Instalment	10.0	approved

Source: Islamic Development Bank.

41. Broad terms used by the IDB for ship financing were the following:

- the ship was expected to have an economic life of 3-5 years after the expiry of the lease/loan period;

- repayment period ranged between 7-10 years with a grace period of 3 years;

- interest charges varied between 8-9 per cent and a 15 per cent rebate was offered on interest due, if repayments were made on time;

- guarantees were required from the government or a first class commercial bank acceptable to IDB.

42. The primary eligibility criterion is that the request for financing should come from an enterprise of a member country and that the application is made through appropriate government channels, usually the Ministry of Finance.

43. The World Bank (IBRD and IDA) stated that its involvement in ship financing has been limited and expressed the view that commercial bank funding was usually more attractive to ship owners/ship operators. The Bank was not always convinced of fleet expansion/development in developing countries, keeping in view the availability of tonnage in international markets with competitive rates and quality services.

44. However, the Bank had several lending operations which indirectly provided finance for ship acquisition. These lending were either general development bank credits to Development Finance Companies (DFC) or industrial development projects. Details on these lending were published in the earlier report by the UNCTAD secretariat. [8]

5. Mezzanine finance

45. This form of finance could be viewed as a bridging arrangement, except that this method would be more expensive when compared to the commercial loan. In terms of capital ranking it is after the senior debt but before

the ordinary equity. Many forms of financial instruments are used for it, such as secured and unsecured loan stock or preferred shares or subordinate notes or a second mortgage loan. In some cases, such an arrangement would have the option to convert into ordinary equity.

46. As mezzanine financing is less secure than the senior debt, the interest cost tends to be higher. There are indications of increasing use of such a method, as it is a means to bridge the difference between the owner's equity and the secured first mortgage loans. The borrower may thus have a reduced commitment of equity with scope for maximizing the potential return on equity. While many variations of the financial instruments may be used to raise the subordinate debt, the merits of each package would have to be examined on a case-by-case basis. One company had been reported to be active in provision of such financing arrangement. [9] Such arrangements have been extensively used in purchase of second-hand ships and the operation of the ship was for a limited period to take advantage of short-term market up-turns in certain sectors, and speculative asset value.

47. For developing countries' shipping enterprises, this method may be able to reduce the country risk element, as far as the first mortgagee would be concerned, thus increasing their access to finance, but at a cost.

6. Joint ventures

48. The increasing relevance of joint ventures in shipping had been observed through the cooperative arrangements in the liner sector. Such cooperation was largely limited to the operators of the developed countries. The main reason for entering a joint venture is generally that neither party on its own has at its disposal all the elements necessary to realize the objectives of the venture. Thus the need to pool resources with other operators. In the context of ship financing the primary objective of a developing country shipping enterprise would be to gain access to much needed finance. On the other hand, the partner from the developed country may have other incentives. Given their potential, such ventures should not be limited to North-South cooperation but also South-South. The elements which supplement each of the partners could provide impressive economies of scale.

7. Leasing

49. Ship leasing contracts are negotiated by the lessor and the lessee, yet the existence of an international legal framework clearly defining the rights and obligations of the parties to such a transaction would encourage cross-border leasing. The UNIDROIT Convention on International Financial Leasing, 1988, covers leasing of equipments, including ships.

50. While leasing has become a popular method of financing ship acquisition, operational leasing had previously existed under the terminology of bareboat demise charter. Bareboat chartering, though a favourable method of ship acquisition with virtually no financial outlay, had not been extensively used by developing countries. "This mode of bareboat chartering ships first and subsequently owning them should catch the imagination of aspiring developing countries to expand their merchant fleet.... The expansion programmes, on the other hand, cannot be indefinitely postponed, for the reason that survival depends on prudently shedding their [developing countries] uneconomic tonnage and replacing them with modern, technologically advanced ships." [10]

51. A report by the UNCTAD secretariat - *Container Ship Leasing*, (TD/B/C.4/339) - examines the advantages and disadvantages of leasing, among other issues related to leasing. While leasing may be an attractive option for acquiring ships, specifically in cross-border leasing, the lessor may be obliged to register the ship in his home country to claim tax benefits or to conform to legislations pertaining to chartering out of ships. Thus in certain cases the bareboat chartered vessel may not fly the charterer's country flag.

52. In one of the responses a shipping company in a developing country stated it had arranged for a lease of a containership, but had to register the ship under an open-registry flag. Another response indicated that, while arrangements were being finalized for the acquisition of eight tankers under leasing, the ships would be registered under a open-registry flag. In the case of developing countries, suitable legislative changes need to made to support bareboat chartering.

Chapter III

ABILITY TO REPAY

53. A study merely of the different financial terms available would not determine the adequacy of ship financing. The ability to repay those loans under current market conditions is equally important. To provide a general picture of the current and expected future situations certain hypothetical examples have been worked out. The essential focus is on timing of the purchase as the value of the ships is subject to variations.

54. Factors which affect the ability to repay are the market freight rate, size and structure of capital cost, and - most important - operating costs. The first two elements are dependent on the market forces and operating cost may be controlled to some extent by the shipowner. A number of costs make up the operating costs, such as manning, repair and maintenance, insurance, store and lubes, and administrative costs. In the analysis a 5 per cent escalation has been considered. However, a leading ship management company predicts an escalation of 9 per cent per annum between 1990 and 1995. [11] It also forecasts a shortage of qualified and experienced seafarers, which would result in increased manning costs. A report examining ship costs suggests that repair and maintenance cost will increase more than double by the year 2000. Further, insurance costs will escalate with increasing ship values and increasing liabilities arising particularly from oil pollution and other environmental risks (see table 10).

Table 10

Vessel running cost forecast for a handy-size bulk carrier

Cost components	1990	1995	Average per cent/year increase
	$/day	$/day	
Total crew cost a/	1 931	2 835	8
Stores & equipment	329	461	7
Lubes	178	238	6
R & M	548	769	7
Insurance	397	507	20
Administration	425	1 058	5
Total	3 808	5 868	9

Source: *Lloyd's Shipping Economist*, December 1991, p. 3.

a/ Including wages, travel and victualling.

55. An assessment is made by comparing the break-even time charter rates under different loan agreements. Break-even charter rates have been computed for the period of the loan and they cover both the capital cost and the operating costs. In the conduct of an analysis, a number of options are available. These have been kept to minimum to provide a base case. The detailed set of assumptions of data and the method used is shown in annex II.

A. Newbuilding case studies

56. Table 11 shows the break-even charter rates under two alternative loan agreement, if orders for newbuildings were placed in 1985 and commence trading in 1987, for a 27,000 dwt bulk carrier and a 80,000 dwt tanker. During this period the prices of both newbuildings and second-hand ships were the lowest. As can be observed from graphs 5 and 6, in the case of a bulk carrier, bearing in mind that the ships were ordered at the lowest price and assuming the loan had been under the OECD terms (except for 1989), in all other years the market rates would not have been able to cover the capital and operating costs. Had the loan been under the UNCTAD V resolution terms (see annex II), then the market rates would have covered its capital and operating costs. Considering that higher break-even rates are required in the later years, under current market rates the venture would not be able to create sufficient cash surpluses to support asset renewal.

Table 11

Comparison of break-even and actual market time charter rates
in $US per day

Loan 1: 27,000 dwt, Bulk carrier, newbuilding 1985, trading 1987.

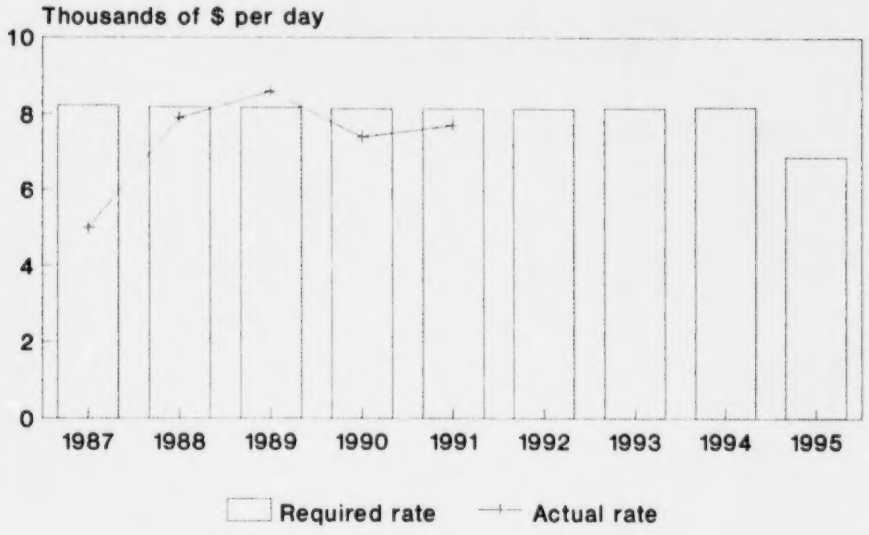
Year	Rates on OECD terms	Rates on UNCTAD V resolution terms	Actual market (1 Year) time charter rates average
1987	8 230	6 866	5 000
1988	8 194	6 957	7 900
1989	8 167	7 056	8 600
1990	8 150	7 166	7 400
1991	8 143	7 285	7 700
1992	8 147	7 415	
1993	8 162	7 557	
1994	8 188	7 710	
1995	6 868	7 875	
1996		8 054	
1997		8 364	
1998		8 573	
1999		8 798	
2000		9 038	

Loan 2: 80,000 dwt, Tanker, newbuilding 1985, trading 1987.

Year	Rates on OECD terms	Rates on UNCTAD V resolution terms	Actual market (1 Year) time charter rates average
1987	12 615	10 093	7 467
1988	12 418	10 129	10 400
1989	12 231	10 177	9 333
1990	12 056	10 235	10 667
1991	11 892	10 305	11 467
1992	11 740	10 387	
1993	11 601	10 482	
1994	11 476	10 591	
1995	8 849	10 713	
1996		10 851	
1997		11 161	
1998		11 333	
1999		11 522	
2000		11 729	

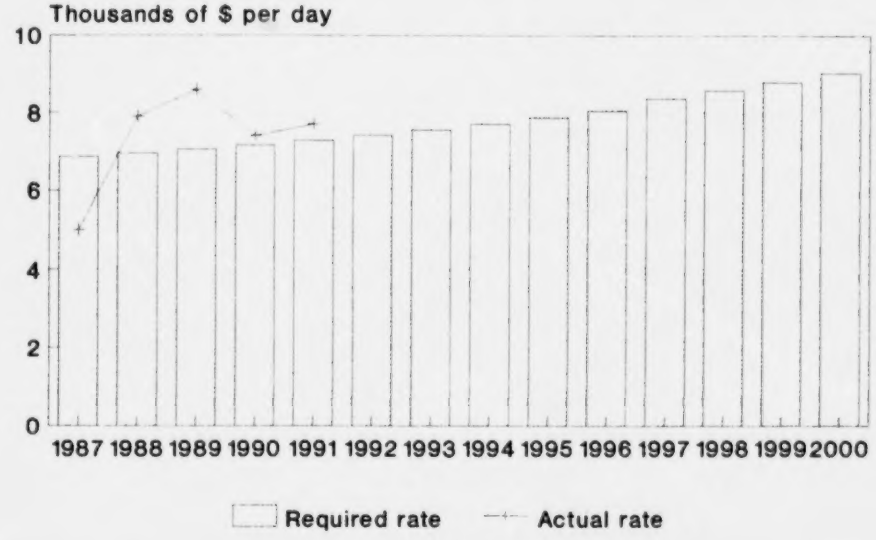
Graph 5

Required charter rate versus actual market rate
for a 27,000 dwt bulk carrier, built 1985. (OECD terms)



Graph 6

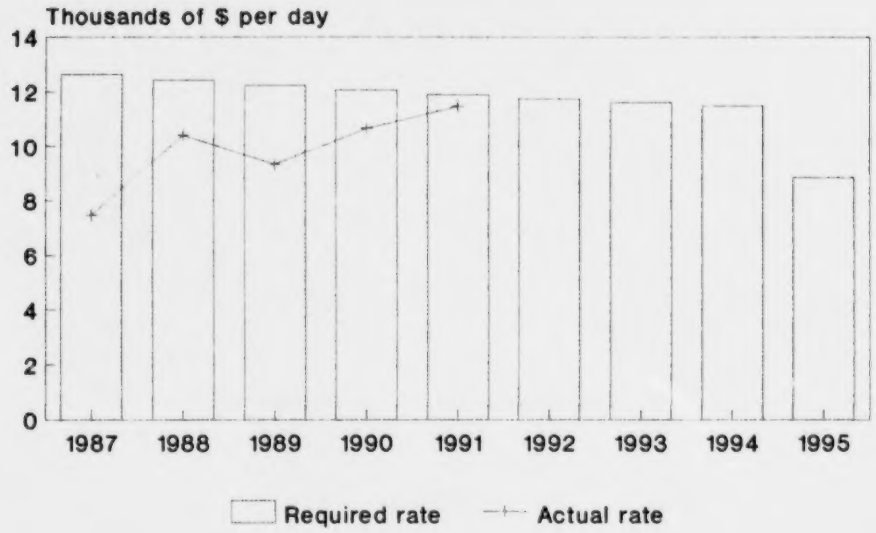
Required charter rate versus actual market rate for a 27,000 dwt bulk carrier,
built 1985. (UNCTAD V resolution terms)



57. In the case of tanker, applying the above cited criteria, under the OECD terms, the actual market rates would not cover the capital and operating costs as shown in graph 7. However, under the UNCTAD V resolution terms, in 1990 and 1991 market rates were sufficient to cover the capital and operating costs as shown in graph 8.

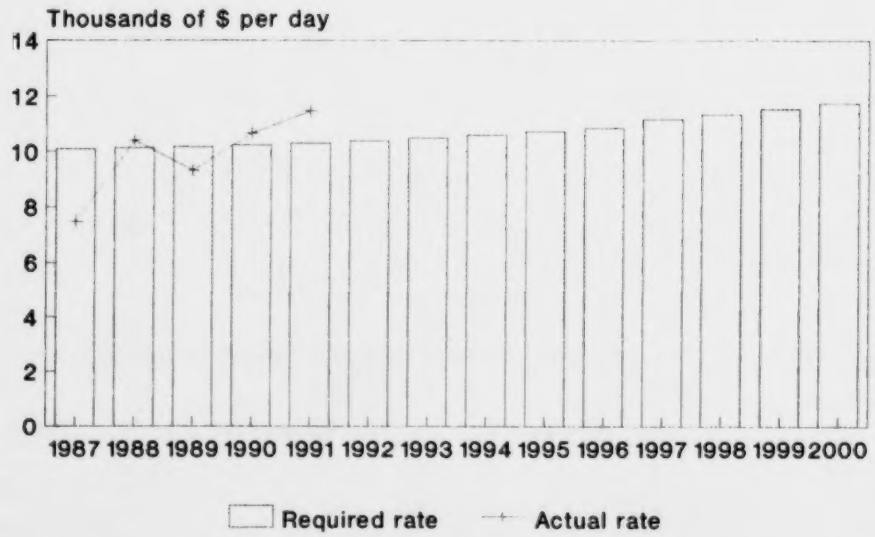
Graph 7

Required charter rates versus actual market rates for a 80,000 dwt tanker, 1985 built. (OECD terms)



Graph 8

Required charter rates versus actual market rates for a 80,000 dwt tanker, 1985 built. (UNCTAD V resolution terms)



58. Table 12 shows the break-even charter rates in $US per day under four alternative loan conditions for newbuilding, if they were to be ordered in 1990 and use for trading in 1992. The analysis is limited to certain standard ship types for which the information were readily available. Table 13 shows the break-even tramp trip charter rate in $US per dwt per month required for a 15,000 dwt general cargo ship built in 1990 and used for trading in 1992 under similar alternative loan conditions.

59. The alternative loan conditions are the standard OECD terms and a variation if the interest charge were to be 5 per cent. The OECD terms at a lower interest rate of 5 per cent, when related to the UNCTAD V resolution terms, illustrates differences with respect to loan repayment duration. The third example shows a loan under UNCTAD V resolution terms with inclusion of a grace period of three years.

60. The inclusion of additional costs incurred by the shipowner towards down payment, if other commercial loans were availed to top up the equity amount or furnishing of bank guarantees, would only raise the break-even charter rates higher. Similarly, if a return on investment were to be considered, the break-even charter rates would have to be raised accordingly.

61. While the analysis considers seven different types of ship, it provides an indication of the required break-even freight rates. Such an analysis would be of little use, if no assessment of the future freight rates were to be made. As forecasting future freight rates would be difficult, an indication of trend would be useful. Graphs 9 to 11 show the linear trends based on the actual rates of the last ten year period. Among the three cases under consideration, the deviation from the trend line is relatively small in the case of the tanker market for a size range of 30,000 dwt. Large deviations were noted in case of a 27,000 dwt bulk carrier and 15,000 dwt general cargo ship. The freight rates rose dramatically between 1986 and 1988, while a moderate rise was noticed for the years 1990 and 1991. While the trend in all cases suggests an upward movement of rates in the future based on past rates, unless the rates are sufficiently above the current level it would be difficult for shipping enterprises to make a reasonable profit and support asset renewal.

Table 12

Comparison between break-even time charter rates
in $US per day

Loan 1: 30,000 dwt Tanker, newbuilding 1990

Year	Rates on OECD terms	Rates on OECD duration with 5 per cent interest	Rates on UNCTAD V resolution terms	Rates on UNCTAD V terms with grace period
1992	17 571	15 524	13 481	7 909
1993	17 107	15 308	13 396	8 107
1994	16 653	15 102	13 321	8 314
1995	16 209	14 906	13 257	14 104
1996	15 776	14 722	13 203	14 051
1997	15 355	14 549	13 161	14 009
1998	14 946	14 387	13 131	13 978
1999	14 549	14 239	13 114	13 961
2000	10 087	10 025	13 109	13 957
2001			13 119	13 966
2002			13 331	14 190
2003			13 371	14 231
2004			13 428	14 287
2005			13 501	14 361
2006				14 452
2007				14 563
2008				14 693

Loan 4: 27,000 dwt Bulk Carrier, newbuilding 1990

Year	Rates on OECD terms	Rates on OECD duration with 5 per cent interest	Rates on UNCTAD V resolution terms	Rates on UNCTAD V terms with grace period
1992	13 713	12 246	10 782	6 789
1993	13 436	12 147	10 777	6 986
1994	13 170	12 058	10 782	7 194
1995	12 914	11 980	10 798	11 405
1996	12 668	11 913	10 824	11 432
1997	12 434	11 856	10 862	11 469
1998	12 213	11 812	10 912	11 519
1999	12 003	11 781	10 975	11 582
2000	8 884	8 840	11 050	11 658
2001			11 140	11 747
2002			11 405	12 021
2003			11 526	12 142
2004			11 664	12 280
2005			11 819	12 435
2006				12 608
2007				12 799
2008				13 011

Table 13

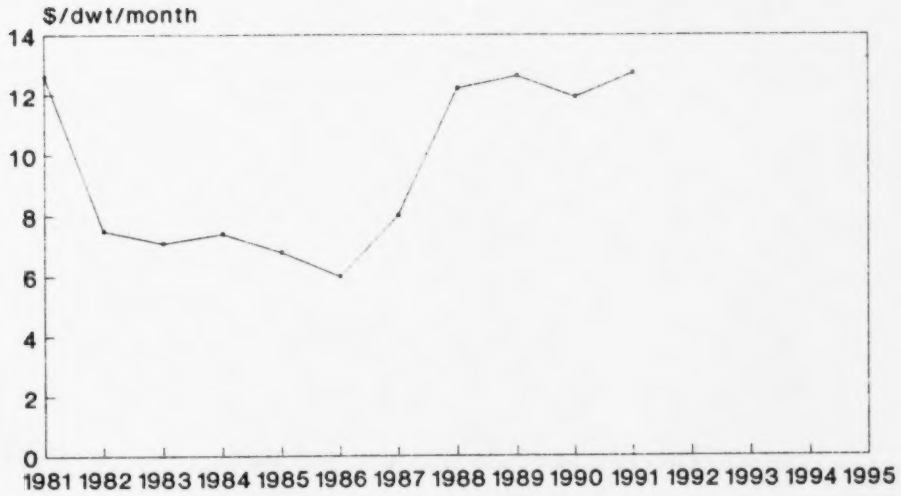
Comparison between break-even tramp trip charter rates
in $US per dwt per month

15,000 dwt General cargo ship, newbuilding 1990

Year	Rates on OECD terms	Rates on OECD duration with 5 per cent interest	Rates on UNCTAD V resolution terms	Rates on UNCTAD V terms with grace period
1992	29.17	25.89	22.62	13.71
1993	28.48	25.60	22.54	14.08
1994	27.81	25.33	22.48	14.47
1995	27.16	25.07	22.43	23.79
1996	26.52	24.84	22.41	23.76
1997	25.91	24.62	22.40	23.76
1998	25.33	24.43	22.42	23.78
1999	24.76	24.27	22.47	23.82
2000	17.70	27.60	22.53	23.89
2001			22.62	23.98
2002			23.07	24.45
2003			23.22	24.60
2004			23.40	24.78
2005			23.62	24.99
2006				25.24
2007				25.52
2008				25.84

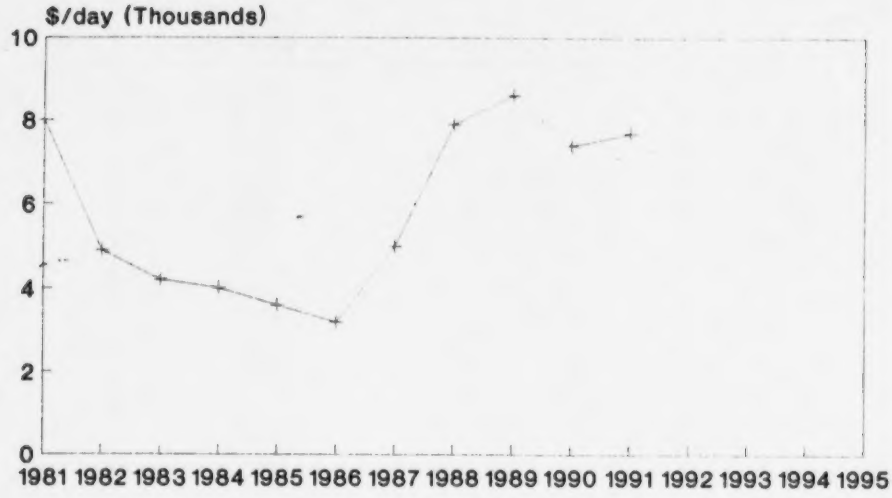
Graph 9

Trend in freight rates (trip charter) for a 15,000 dwt general cargo ship
in $US per dwt per month



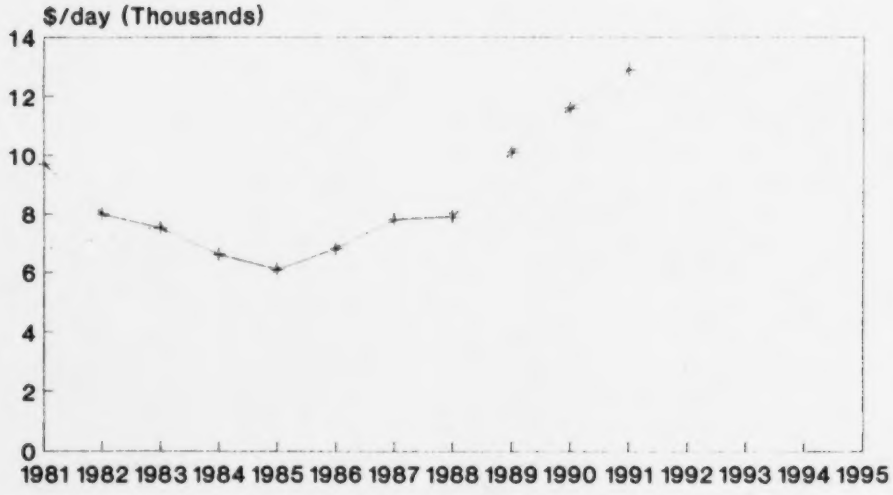
Graph 10

Trend in freight rates (time charter) for a 27,000 dwt bulk carrier
in $US per day



Graph 11

Trend in freight rate (time charter) for a 30,000 dwt tanker
in $US per day



B. Second-hand ships case studies

62. Based on the assumptions detailed in annex II, comparisons are made for the vessel being bought with commercial loans, or under UNCTAD V terms for second-hand ships, and the actual market rates for years 1990 and 1991. The cases considered are a 27,000 dwt bulk carrier, a 80,000 dwt tanker, and a 15,000 dwt general cargo ship - all five year-old ships. The results of the computation are presented in tables 14 to 16, and a direct evidence on the set of assumptions are, that the actual market rates do not provide the returns to cover capital and operating costs under the two loan conditions in all cases.

Table 14

Comparison of required break-even and actual market time charter rates
for a 27,000 dwt bulk carrier
in $US per day

Year	Required break-even rates under a commercial loan	Required break-even rates under UNCTAD V resolution	Actual market rates yearly average
1990	9 405	7 965	7 400
1991	8 850	8 004	7 700
1992	8 983	8 053	
1993	8 787	8 112	
1994	8 600	8 180	
1995		8 260	
1996		8 350	
1997		8 452	
1998		8 567	
1999		8 695	

Table 15

Comparison of required break-even and actual market time charter rates
for a 80,000 dwt tanker
in SUS per day

Year	Required break-even rates under a commercial loan	Required break-even rates under UNCTAD V resolution	Actual market rates yearly average
1990	22 409	17 956	10 667
1991	20 360	17 745	11 467
1992	20 421	17 546	
1993	19 446	17 359	
1994	18 483	17 186	
1995		17 026	
1996		16 881	
1997		16 750	
1998		16 636	
1999		16 539	

Table 16

Comparison of required break-even and actual market tramp trip charter rates
for a 15,000 dwt general cargo ship
in SUS per dwt per month

Year	Required break-even rates under a commercial loan	Required break-even rates under UNCTAD V resolution	Actual market rates yearly average
1990	17.98	15.31	11.9
1991	16.98	15.40	12.7
1992	17.25	15.53	
1993	16.92	15.66	
1994	16.60	15.82	
1995		16.00	
1996		16.20	
1997		16.43	
1998		16.68	
1999		16.96	

Chapter IV

CONCLUSIONS

63. Extensive fleet replacement would have to be undertaken by developing countries over the next five-year period. Replacement with second-hand ships may not be feasible on a large scale. There would be a need for newbuilding tonnage for the fleet renewal programme of developing countries. The amount of finance required may not be easily available from the traditional sources of the past. Increased equity participation would be a prerequisite for the lending institutions.

64. The study has noted that a variety of loan terms and conditions are theoretically possible for purchase of a ship based on variations in down payment, the rate of interest, the repayment period, the grace period and the nature of resources securing the loan. From the borrower's point of view, favourable loan terms (low interest rate and long repayment period) result in a much lower level of debt service, especially in the early years. A careful quantification of the cash-flow discounting appraisal method, among the available different loans, is required to determine the most suitable condition. The choice of currency for the purchase of a ship would have an impact on the repayment capabilities.

65. Funds from international or regional development banks have not been a major source of ship financing in developing countries.

66. The current market charter rates are substantially below the required break-even rates when financing is obtained under the OECD terms. This is evidenced by the fact that certain types of ship, if they had been purchased at the lowest price in the past under the OECD terms, would not be able to cover the required break-even charter rates. As both capital cost and operating costs are expected to increase in the future, unless a substantial rise in freight rates occurs, developing countries' investments in newbuilding and second-hand ships are likely to incur substantial losses.

67. Leasing would be the most appropriate source of financing for developing countries, as no large cash out-lay is required. However, freight rates would also have to increase to allow the lessors to obtain a sufficient return on their investment. To facilitate leasing, suitable changes would have to be made to national legislation.

Notes

1. *Finance for ship purchase* (TD/B/C.4/139); *Merchant fleet development: Ship financing for developing countries* (TD/B/C.4/294); *Major issues in world shipping: (a) Merchant fleet development* (TD/B/C.4/301).

2. Dr. Martin Stopford," Shipping Investment" in *Seatrade Business Review*, March/April 1989, p. 21.

3. World Bank, "India's growing conflict between trade and transport", 1990.

4. "A protracted credit squeeze", *Lloyd's Shipping Economist*, June 1984, p. 14.

5. "Banking crisis could destabilise shipping", *Lloyd's List*, 18 April 1988.

6. Bruce Vail, "What the bankers learned", *American Shipper*, February 1988, p. 59.

7. The World Bank, the African Development Bank, the Asian Development Bank, the Caribbean Development Bank, the Inter-American Development Bank, the Islamic Development Bank, and the Arab Fund for Economic and Social Development.

8. See UNCTAD report, *Ship financing for developing countries*, (TD/B/C.4/294).

9. "Mezzanine Capital: growing importance", *Lloyd's Shipping Economist*, October 1991, pp. 9-12.

10. V.D. Chowgule's statement to the ICC symposium on bareboat chartering, Bareboat Charter Registration, ICC, Paris, p. 32.

11. "Cost push", *Lloyd's Shipping Economist*, December 1991, p. 3.

Annex I

Prices of newbuilding for selected types of ships
(in millions of $US)

Year	Ship type						
	Tanker			Bulk carrier			General Cargo a/
	30,000 dwt	80,000 dwt	130,000 dwt	27,000 dwt	60,000 dwt	120,000 dwt	15,000 dwt
1981	25.0	38.0	51.0	19.0	27.5	42.0	14.0
1982	17.0	24.0	32.5	13.0	18.0	26.0	14.0
1983	16.0	23.0	31.5	12.0	17.0	25.0	13.2
1984	14.5	21.0	29.0	11.0	15.5	24.0	12.8
1985	13.0	18.5	25.0	10.0	14.0	20.5	12.8
1986	14.0	21.0	26.5	11.5	15.0	23.0	14.2
1987	20.0	29.0	34.0	14.0	20.5	30.0	15.0
1988	27.0	38.0	46.0	20.0	27.0	39.0	17.3
1989	31.0	43.0	54.0	22.5	30.0	45.0	28.6
1990	30.0	44.0	55.0	21.5	31.5	46.0	24.0
1991	30.5	44.5	55.5	22.0	32.0	50.0	24.1

Source: Fearnleys (Oslo), *Review*, 1990 and 1991.

Note: The prices are for cash payment and refer to estimate for contracting at year end. Japanese and Korean prices are used as basis.

a/ General cargo prices are for Japanese build as reported in *Lloyd's Shipping Economist*, various issues.

Second-hand values for selected types of ship, five year old,
(in millions of $US)

Year	Ship type						
	Tanker			Bulk carrier			General Cargo a/
	30,000 dwt	80,000 dwt	130,000 dwt	27,000 dwt	60,000 dwt	120,000 dwt	15,000 dwt
1981	11.0	10.0	13.3	9.4	12.8	16.0	8.5
1982	11.0	6.0	9.0	6.2	6.3	7.8	6.1
1983	12.3	11.0	11.0	7.5	7.5	11.0	5.2
1984	8.3	9.0	9.0	6.0	8.8	13.5	4.5
1985	6.5	9.0	8.3	3.8	6.1	11.0	3.2
1986	11.0	13.0	13.8	4.0	7.8	12.0	3.3
1987	13.0	16.0	20.0	7.0	13.0	19.5	3.7
1988	16.0	22.0	28.0	11.0	17.0	27.5	5.2
1989	20.0	34.0	40.0	14.0	21.5	32.0	8.8
1990	21.5	34.0	37.0	11.0	18.5	28.0	10.2
1991	20.0	32.0	36.0	13.5	23.0	37.0	10.2

Source: Fearnleys (Oslo), *Review*, 1990 and 1991.

Note: The prices are for prompt delivery, charter free ships, good condition and cash payment, estimate for market values.

a/ General cargo prices as reported in Lloyds Shipping Economist, various issues.

Annex II

Details of assumptions used to calculate break-even charter rates in examples

The examples were analysed using a commercial shipping software used of investment appraisal. The programme had the following facilities to enter data:

- cost details;

  - stage payments on newbuildings;
  - extra capital cost/subsidy items;
  - depreciation policy for profit and loss account purpose;

- financing details;

  - equal principal, annuity and variable repayment schedules;
  - bank guarantee;
  - varying interest rates;
  - moratoria on principal and interest;
  - balloon repayment on loan termination;

- employment details;

  - charter rates on daily, monthly or deadweight basis;
  - variable days on hire per year;
  - hire payable in either advance or in arrears;
  - hire variable from year to year or within a year;

- operating costs;

  - specified daily, monthly or annual basis;
  - provision for lump sum costs;
  - different rates of escalation for each cost item;

- residual value of vessel;

- different currencies with appropriate exchange rates can be specified for different cost items.

The programme calculated, cash-flows, rate of return, required charter rates, required residual value, variation matrices and a consolidated cash-flows for a fleet of ships.

A. OECD terms used are as follows:

(i) Maximum loan = 80 per cent of the contract price;
(ii) Fixed interest rate = 8 per cent per annum;
(iii) Loan repayment period = 8.5 years.

B. UNCTAD V resolution terms (resolution 121 (V)):

(i) Maximum loan = 90 per cent of the contract price;
(ii) Fixed interest rate = 5 per cent per annum;
(iii) Loan repayment period = 14 years for newbuilding, 10 years for second-hand ships;
(iv) Grace period = three years.

C. Assumption for second-hand ships:

(i) The ships were purchased in 1990;
(ii) Interest rate based on 1990 average LIBOR plus spread of 2 percentage points;
(iii) Ships are five years old
(iv) Commercial loan available for 60 per cent of the value with repayment duration of five years.
(v) Alternative loan condition based on UNCTAD V resolution, loan amount 90 per cent of the value with repayment over a ten year period at fixed interest rate of 5 per cent.

D. Other assumptions:

(i) On hire days 355 for the first ten years and 350 days per year from the eleventh year onwards;
(ii) Loan draw-down at the end of construction;
(iii) Escalation of operating costs at a uniform rate of 5 per cent per annum;
(iv) Commission of 2.5 per cent and not paid in advance;
(v) Interest days = 360 per year;
(vi) Residual value of the ship set to zero at the end of the loan period.